

What is claimed is:

1. A method of encoding a sequence of video frames to form a compressed video sequence, said compressed video sequence comprising  
5 frames encoded in at least a first compressed video frame format and a second compressed video frame format, said first compressed video frame format being a non-temporally predicted format and said second compressed video frame format being a temporally predicted format characterised in that the method comprises the steps of:

10 - identifying a first indication associated with a first video frame that said first video frame should be encoded in said first compressed video frame format;  
- associating said first indication with a second video frame;  
- encoding said second video frame in said first compressed video frame  
15 format;  
- defining a first set of video frames comprising N video frames occurring prior to said second video frame;  
- encoding said first set of video frames in said second compressed video frame format;

20 - defining a second set of video frames comprising M video frames occurring after said second video frame;  
- encoding said second set of video frames in said second compressed video frame format.

25 2. A method according to claim 1 characterised in that:  
- said non-temporally predicted format is an INTRA frame format;  
- said temporally predicted format is a forward predicted INTER frame format;

30 3. A method according to claim 1 characterised in that:  
- said non-temporally predicted format is an INTRA frame format;

- said temporally predicted format is a backward predicted B-frame format;

4. A method according to claim 2 characterised in that:

5 5. encoding of said first set of N video frames is achieved by:  
- assigning each of said N video frames a sequential compression order number, said latest occurring video frame of said first set being assigned a lowest compression order number and said earliest occurring video frame being assigned a highest compression order number;

10 - indicating said second video frame as a prediction reference frame for encoding said video frame having said lowest compression order number;  
- encoding said first set of video frames in said forward predicted INTER frame format in ascending order of compression order number.

15 6. A method according to claim 3 characterised in that:  
- encoding of said first set of video frames is achieved by:  
- indicating said second video frame as a prediction reference frame for each of said N video frames;  
- encoding each of said N video frames in said backward predicted B-frame format.

20 6. A method according to any preceding claim characterised in that:  
- said encoding of said second set of M video frames is achieved by:  
25 - assigning each of said M video frames a sequential compression order number, said earliest occurring video frame of said second set being assigned a lowest compression order number and said latest occurring video frame of said second set being assigned a highest compression order number;  
- indicating said second video frame as a prediction reference frame for encoding said video frame having said lowest compression order number;  
30 - encoding said second set of video frames in INTER frame format in ascending order of compression order number.

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7           A method according to claim 1 characterised in that said first indication is an INTRA frame request associated with a scene cut.

5   8.        A method according to claim 1 characterised in that said first indication is a periodic INTRA frame request.

9.        A method according to any preceding claim further comprising:  
identifying a second indication that a further video frame should be encoded  
10 in said first compressed video frame format; and  
for a group of frames including said first video frame and the frames occurring  
between the first video frame and the further video frame, defining said  
second video frame as the frame occurring substantially centrally within the  
group of frames.

15      10.      A method according to claim 9 characterised in that said second indication is an INTRA frame request associated with a scene cut.

20      11.      A method according to claim 9 characterised in that said second indication is a periodic INTRA request.

12.      A method according to claim 9 characterised in that said second indication is a INTRA frame update request received as feedback from a receiving terminal.

25      13.      A method according to claim 9 characterised in that for a group of n frames, said second frame is the  $n/2$  frame of the group of frames, where n is a positive, even integer.

30      14.      A method according to claim 9 characterised in that for a group of n frames, said second frame is the  $(n/2 + 1)$  frame of the group of frames where n is a positive, even integer.

15. A method according to claim 9 characterised in that for a group of n frames, the second frame is the  $(n+1)/2$  frame of the group of frames where n is a positive, odd integer

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16. A method according to any preceding claim further comprising associating with the compressed video sequence information concerning the intended playback order of the frames of the compressed video sequence.

10 17. A method according to any preceding claim further comprising associating with the compressed video sequence information concerning the intended playback time of the frames of the compressed video sequence.

15 18. A video encoder for encoding a sequence of video frames to form a compressed video sequence, said compressed video sequence comprising frames encoded in at least a first compressed video frame format and a second compressed video frame format, said first compressed video frame format being a non-temporally predicted format and said second compressed video frame format being a temporally predicted format characterised in that

20 the encoder comprises:

- means for identifying a first indication associated with a first video frame that said first video frame should be encoded in said first compressed video frame format;

- means for associating said first indication with a second video frame;

25 - means for encoding said second video frame in said first compressed video frame format;

- means for defining a first set of video frames comprising N video frames occurring prior to said second video frame;

- means for encoding said first set of video frames in said second

30 compressed video frame format;

- means for defining a second set of video frames comprising M video frames occurring after said second video frame;

- means for encoding said second set of video frames in said second compressed video frame format.

19. A video codec including a video encoder according to claim 18.

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20. A multimedia content creation system including a video encoder according to claim 18.

21. A multimedia terminal including a video encoder according to claim 18.

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22. A multimedia terminal according to claim 21 characterised in that the terminal is a radio telecommunications device.

23. A method of decoding a compressed video sequence to form a

15 sequence of decompressed video frames, said compressed video sequence comprising frames encoded in at least a first compressed video frame format and a second compressed video frame format, said first compressed video frame format being a non-temporally predicted format and said second compressed video frame format being a temporally predicted format

20 characterised in that the method comprises the steps of:

- identifying a first indication associated with a first video frame that said first video frame is encoded in said first compressed video frame format;

- decoding said first video frame

- receiving a first set of N frames in said second compressed video

25 frame format for inclusion in said decompressed video sequence prior to said first video frame;

- decoding said first set of N video frames;

- re-ordering the frames of the first set of frames in accordance with playback information associated with the frames of the first set;

30 - receiving a second set of M video frames in said second compressed video frame format for inclusion in said decompressed video sequence after said first video frame;

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- decoding said second set of video frames.

24. A video decoder for decoding a compressed video sequence to form a sequence of decompressed video frames, said compressed video sequence comprising frames encoded in at least a first compressed video frame format and a second compressed video frame format, said first compressed video frame format being a non-temporally predicted format and said second compressed video frame format being a temporally predicted format characterised in that the decoder comprises:

5 10 - means for identifying a first indication associated with a first video frame that said first video frame is encoded in said first compressed video frame format;

- means for decoding said first video frame

- means for receiving a first set of N frames in said second compressed

15 video frame format for inclusion in said decompressed video sequence prior to said first video frame;

- means for decoding said first set of N video frames;

- means for ordering the frames of the first set of frame in accordance with playback information associated with the frames of the first set;

20 - means for receiving a second set of M video frames in said second compressed video frame format for inclusion in said decompressed video sequence after said first video frame;

means for decoding said second set of video frames.

25 25. A video codec including a video decoder according to claim 24.

26. A multimedia content retrieval system including a video decoder according to claim 24.

30 27. A multimedia terminal including a video decoder according to claim 24.

28. A multimedia terminal according to claim 27 characterised in that the terminal is a radio telecommunications device.

29. A computer program for operating a computer as a video encoder for  
5 encoding a sequence of video frames to form a compressed video sequence,  
said compressed video sequence comprising frames encoded in at least a  
first compressed video frame format and a second compressed video frame  
format, said first compressed video frame format being a non-temporally  
predicted format and said second compressed video frame format being a  
10 temporally predicted format characterised in that said computer program  
comprises:

- computer executable code for identifying a first indication associated  
with a first video frame that said first video frame should be encoded in said  
first compressed video frame format;
- 15 - computer executable code for associating said first indication with a  
second video frame;
- computer executable code for encoding said second video frame in  
said first compressed video frame format;
- computer executable code for defining a first set of video frames  
20 comprising N video frames occurring prior to said second video frame;
- computer executable code for encoding said first set of video frames in  
said second compressed video frame format;
- computer executable code for defining a second set of video frames  
comprising M video frames occurring after said second video frame;
- 25 - computer executable code for encoding said second set of video  
frames in said second compressed video frame format.

30. A computer program for operating a computer as a video decoder for  
decoding a compressed video sequence to form a sequence of  
30 decompressed video frames, said compressed video sequence comprising  
frames encoded in at least a first compressed video frame format and a  
second compressed video frame format, said first compressed video frame

format being a non-temporally predicted format and said second compressed video frame format being a temporally predicted format characterised in that said computer program comprises:

- computer executable code for identifying a first indication associated 5 with a first video frame that said first video frame is encoded in said first compressed video frame format;
- computer executable code for decoding said first video frame
- computer executable code for receiving a first set of N frames in said second compressed video frame format for inclusion in said decompressed 10 video sequence prior to said first video frame;
- computer executable code for decoding said first set of N video frames;
- computer executable code for ordering the frames of the first set of frame in accordance with playback information associated with the frames of the first set;

15 - computer executable code for receiving a second set of M video frames in said second compressed video frame format for inclusion in said decompressed video sequence after said first video frame;

- computer executable code for decoding said second set of video frames.

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31. A computer program according to claims 29 and 30.

32. A storage medium comprising a computer program for operating a computer as a video encoder for encoding a sequence of video frames to 25 form a compressed video sequence, said compressed video sequence comprising frames encoded in at least a first compressed video frame format and a second compressed video frame format, said first compressed video frame format being a non-temporally predicted format and said second compressed video frame format being a temporally predicted format 30 characterised in that said storage medium comprises:

- computer executable code for identifying a first indication associated with a first video frame that said first video frame should be encoded in said first compressed video frame format;
- computer executable code for associating said first indication with a 5 second video frame;
- computer executable code for encoding said second video frame in said first compressed video frame format;
- computer executable code for defining a first set of video frames comprising N video frames occurring prior to said second video frame;
- 10 - computer executable code for encoding said first set of video frames in said second compressed video frame format;
- computer executable code for defining a second set of video frames comprising M video frames occurring after said second video frame;
- computer executable code for encoding said second set of video 15 frames in said second compressed video frame format.

33. A storage medium comprising a computer program for operating a computer as a video decoder for decoding a compressed video sequence to form a sequence of decompressed video frames, said compressed video sequence comprising frames encoded in at least a first compressed video frame format and a second compressed video frame format, said first compressed video frame format being a non-temporally predicted format and said second compressed video frame format being a temporally predicted format characterised in that said storage medium comprises:

- 20 25 - computer executable code for identifying a first indication associated with a first video frame that said first video frame is encoded in said first compressed video frame format;
- computer executable code for decoding said first video frame
- computer executable code for receiving a first set of N frames in said 30 second compressed video frame format for inclusion in said decompressed video sequence prior to said first video frame;
- computer executable code for decoding said first set of N video frames;

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- computer executable code for ordering the frames of the first set of frame in accordance with playback information associated with the frames of the first set;
- computer executable code for receiving a second set of M video frames in said second compressed video frame format for inclusion in said decompressed video sequence after said first video frame;
- computer executable code for decoding said second set of video frames.

10 34. A method of encoding a sequence of video frames to form a compressed video sequence, said compressed video sequence comprising frames encoded in at least a first compressed video frame format and a second compressed video frame format, said first compressed video frame format being a non-temporally predicted format and said second compressed

15 video frame format being a temporally predicted format characterised in that the method comprises the steps of:

- identifying a first indication associated with a first video frame that said first video frame should be encoded in said first compressed video frame format; and
- 20 - associating said first indication with a second video frame in such a way as to reduce a prediction path length in said compressed video sequence.